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Impact Assessment of Policy-Oriented Research in the CGIAR: A Scoping Study Report

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CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

Consultative Group on International Agricultural Research
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Foreword

Policy-oriented research (POR) comprises an increasingly significant share of the research portfolio of Consultative Group on International Agricultural Research (CGIAR), with the annual budget having risen from less than US$30 million in 1995 (9 percent of the total budget) to more than US$70 million presently (18 percent), when conservatively estimated. Using a more liberal definition, the figures may be more than twice that. Yet, it is one of the areas of CGIAR activities with the least compiled evidence of impact. That policy research (and with it, natural resources management research) remains an 'under-evaluated' area of investment within the CGIAR was a key point highlighted in a major World Bank evaluation study two years ago, and has since raised critical questions about the direction of the CGIAR. How can the CGIAR continue to shift resources away from areas of research for which it has consistently demonstrated impact and high economic rates of return, e.g., crop germplasm improvement, in favor of research for which little documented evidence of impact exists?

During the plenary session of the CGIAR's Annual General Meeting in Nairobi in 2003, donors made an explicit request to the Science Council and, through them, to the Standing Panel on Impact Assessment (SPIA), to undertake a systemwide assessment of the impacts from CGIAR investments in POR. The SPIA was ready to take up this challenge but as the timing of the request coincided with a scheduled External Program and Management Review (EPMR) of the International Food Policy Research Institute (IFPRI), the CGIAR center most actively engaged in policy research and the center which has most experience in conducting POR impact assessments, the SPIA deferred this study for one year.

From the SPIA's point of view, the motivation for this study was straightforward: at the time it was not possible to determine whether the absence of evidence of impact from CGIAR-conducted policy research was due to lack of impact *per se*, to a lack of attention in this area, or to inherent methodological difficulties, with the latter constituting the SPIA's null hypothesis. Estimation of the impacts of POR poses special problems of attribution and quantification. With policy outcomes, innovation sources are not often easy to identify, as there are many complementary sources of information behind policy shifts. Also, relevant policy innovations with global public goods characteristics are rarely directly adoptable by target policy-makers. Counterfactual issues are also particularly complicated in this arena, and research that produces confirmatory results has impacts that are especially difficult to discern. These methodological difficulties, as formidable as they are, do not reduce the need for impact from POR to be demonstrated, as the CGIAR and its stakeholders require evidence of impact from their growing level of investment in this arena.

With this as the background, the SPIA realized that progress towards establishing a credible set of impact assessment methods for policy research was very much needed. And to the extent that methods were lacking to convincingly document the impact of policy research on CGIAR goals (or lack thereof), efforts would need to made in that direction. It was recognized that it may be possible to only go as far as assessing outcomes, influences, responses, and likely impact pathways, stopping short of translating these into actual impacts on the poor, the food insecure, and the environment. Finally, it was recognized that relevant approaches would probably have to rely on qualitative methods for attribution and counterfactual establishment as a prelude to any quantitative approaches.

Thus, in early 2005, the SPIA embarked on an exploratory study of POR impacts, with a major objective being to evaluate the existing evidence of both direct and indirect policy research outcomes along the impact pathway from different types of CGIAR

research. For this study the SPIA contracted the services of a consultant, David Raitzer, author of the recently completed benefit–cost meta-analysis of CGIAR research investments, who, working in collaboration with SPIA members Hans Gregersen, Jim Ryan, and Tim Kelley, designed and executed this scoping study. The study consisted of several key activities including: (1) defining/clarifying terminology and distinguishing between the different forms of CGIAR policy-related research; (2) reviewing methods employed in the POR *ex-post* impact assessments produced to date; (3) undertaking a comprehensive literature inventory of CGIAR POR impact assessments and characterizing/analyzing these with respect to type of impact measured (diffusion, influence, or impact) and rigor; (4) hosting a mini-workshop with selected experts to discuss the feasibility of establishing causal linkages between research and policy-making; and (5) making subjective judgments about the adequacy of existing studies in the light of the above and when measured against the total investment in POR in the CGIAR.

The scoping study reported here identifies the number, type, and characteristics of the CGIAR POR impact assessments to date, and provides an evaluation of what has been achieved by the centers thus far. Some useful studies have been identified that document impact, e.g., rice trade policy in Vietnam and two studies in Bangladesh, and that document influence, e.g., the criteria and indicators for forest management, the Partnership for Tropical Forest Margins (formerly Alternatives to Slash and Burn, ASB) program, and policy research in Malawi. Nevertheless, the majority of the impact assessments of POR identified in this study focused on diffusion.

Given that the primary rationale for the study was to demonstrate accountability for the large investments made, this would seem to imply that a focus only on intermediate products such as outcomes, influences, and policy responses is insufficient. Although documenting these elements is challenging enough, additional efforts must be devoted to moving further down along the impact pathway from research to the impact on the ultimate goals of the CGIAR related to poverty alleviation, food security, and environmental protection and enhancement. Thus, the conclusion reached by the SPIA in this scoping study is that given the total investment to date in POR by the CGIAR, conservatively estimated at over US$800 million, the range and number of POR impact assessments, particularly those that go beyond mere 'diffusion' to examine 'influence' and 'impact', seems inadequate. This is especially so when compared to crop germplasm improvement impact assessments. Having said this, the SPIA recognizes the higher degree of difficulty and methodological challenges inherent in attempting to document impact from POR. However, all of this clearly suggests the need for a second phase in the POR impact assessment study, options for which are outlined in the concluding sections of this report.

The SPIA would like to put on record its appreciation to Hans Gregersen, ex-Chair of the SPIA, for conceptualization of the study and moving it forward; to David Raitzer, presently Research Impact Assessment Scientist at the Center for International Forestry Research (CIFOR), who provided background analysis, undertook the literature searches, and intiated the first analysis of the studies; to Carol Weiss (Harvard Graduate School of Education), Ammar Siamwalla (Thailand Development Research Institute), and Prabhu Pingali (Food and Agriculture Organization of the United Nations (FAO)), all of whom were engaged in reviewing early results of the scoping study and participated in the mini-workshop at FAO in December 2005; and to Fred Carden (International Development Research Centre (IDRC)), who carefully reviewed and critiqued an earlier draft of the final report. Tim Kelley deserves special thanks for contributing to the study and to this report. Finally, in the interests of full information I should confess to also playing a role in the study's conduct and the report drafting.

Jim Ryan
Chair, SPIA/SC

Acronyms

ACIAR	Australian Centre for International Agricultural Research
ASB	Partnership for the Tropical Forest Margins (formerly Alternatives to Slash and Burn)
CGIAR	Consultative Group on International Agricultural Research
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture)
CIFOR	Center for International Forestry Research
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo (International Maize and Wheat Improvement Center)
CIP	Centro Internacional de la Papa (International Potato Center)
epIA	*ex post* impact assessment
EPMR	External Program Management Review
FAO	Food and Agriculture Organization of the United Nations
IARC	international agricultural research center
ICARDA	International Center for Agricultural Research in the Dry Areas
ICRAF	World Agroforestry Centre (also the International Centre for Research in Agroforestry)
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDRC	International Development Research Centre
IFPRI	International Food Policy Research Institute
IITA	International Institute of Tropical Agriculture
ILRI	International Livestock Research Institute
IPGRI	International Plant Genetic Resources Institute
IRRI	International Rice Research Institute
ISNAR	International Service for National Agricultural Research
IWMI	International Water Management Institute
MTP	Medium-Term Plan
NARS	national agricultural research system
ODI	Overseas Development Institute
POR	policy-oriented research
RAPID	Research and Policy in Development
SPIA	Standing Panel on Impact Assessment
WorldFish	WorldFish Center (formerly International Center for Living Aquatic Resources Management, ICLARM)
WTO	World Trade Organization

Summary

In response to many requests from donors to the Consultative Group on International Agricultural Research (CGIAR), the Standing Panel on Impact Assessment (SPIA) of the Science Council initiated this study to document the impact of growing investment by the CGIAR System in policy-oriented research (POR). The reference to 'policy' in this study does not define the sector or discipline of research; rather, this classification is based on the intended primary pathway to impact. The research involved can be in the social, biological, or physical sciences, as long as it was undertaken primarily to influence policy as a means of generating ultimate impact.

The study first involved a review of the literature on the role of research information in agricultural policy processes and the formulation of specific policies. This was followed by an analysis of the POR portfolio in the CGIAR, using a taxonomy devised to distinguish among the various types of POR and their logical pathways to impact. Trends in the investment made by the CGIAR in POR were compiled using both a narrow and a more inclusive definition. A catalog of *ex post* impact assessment (epIA) studies was developed and their methods and results reviewed to see to what extent CGIAR investments had been justified by the documented evidence of policy outcomes, influences, responses, and resulting impacts on the poor, the food insecure, and the environment. Some lessons were drawn regarding emerging best practices in epIA of POR and a number of options arrayed for possible future studies.

The literature reviewed shows that policy-making is a serendipitous process, which is often driven by individual expectations of political support, rather than intentions to implement socially optimal solutions to problems. Furthermore, decision-makers are flooded with information, and have limited capacity to directly consider external research findings. The use of POR is neither observable nor easy to track, as there are no reliable objectively verifiable indicators of adoption.

To have impact, policy decisions must be influenced and altered relative to the course of events without the information. However, the basis for a particular decision taken by a policy-maker is rarely revealed. To determine how a particular decision was taken, those involved must be queried about the deliberative process involved and information sources considered. Thus, attribution will depend upon subjective recall by those concerned, and is necessarily qualitative. When influential, policy recommendations are often partially adopted, or are adapted and modified through long and indirect processes of influence and political compromise. Additionally, the causal pathway from policy influence to impact may often be particularly protracted and difficult to attribute. In this challenging context, impact assessments can employ quantitative or qualitative approaches, or a mixture of both.

CGIAR investment in POR, when narrowly defined as in CGIAR Secretariat reports, represents about 18 percent of the current total annual investment. By this definition, since its inception the CGIAR has invested some US$800 million in POR in real 2004 terms. Using a broader definition from the center Medium-Term Plans (MTPs) to include all research projects that list policy-makers, governments, or development agencies as 'users' of project outputs, almost half of the current CGIAR portfolio could be considered POR. On this basis the cumulative investment could be as much as US$2.5 billion.

The study identified 24 epIAs in the centers that trace the diffusion, influence, and/or impact of CGIAR POR outputs. Nearly half of these were conducted by the International Food Policy Research Institute (IFPRI). Only three of the 24 attempted to empirically estimate the economic impacts of the POR and these involved individual country POR, which has more national than international public good attributes. Documenting diffusion and influence seems easier than documenting impact, especially for POR with international

public good features. Ten studies only went as far as identifying the influence of the POR. The balance only went as far as assessing the extent of diffusion of the POR outputs. Twelve of the 24 studies used external assessors while the balance involved center staff. The 24 studies represent a small proportion of the 700 studies of the adoption and impact of CGIAR technologies conducted so far, more than 400 of which focus on crop improvement.

The three studies conducted by the centers that estimate economic impacts of POR do not identify sufficient economic benefits (about US$200 million) to justify even the lower bound estimate of the cumulative investment in POR to date of US$800 million. For the 10 studies of influence to justify the remaining investment (at a minimum, added benefits of approximately US$600 million), each case of influence should be associated with benefits with an implicit present value of at least US$60 million. If the upper bound estimate of cumulative investment in POR of US$2.5 billion is to be recovered, each of the remaining10 studies that document influence should generate on average US$230 million worth of benefits. This seems unlikely. It hence can be reasonably concluded that the level of measured and documented impact and influence attributed to CGIAR POR by rigorous analysis is probably insufficient at present to justify the associated total investment made to date. Considerably more impact (and influence) assessment would need to be conducted before one could be in a position to provide a definitive judgment on this.

The major limitations of most of the epIA POR studies to date are in failing to adequately justify the attribution of influence to specific POR studies, and the lack of an explicit counterfactual scenario by which to assess the value added of the specific POR being evaluated. Thus, there are a number of remaining challenges that need to be addressed in order to move forward in impact assessment of POR in the CGIAR. These relate to:

- Methodological advances
- Establishing counterfactuals and causalities
- Designing appropriate indicators
- Attributing and separating influences, responses, and impacts
- Difficulties of assessing impacts of truly international public good POR
- Determining realistic expectations for future epIA of POR.

Given that the primary rationale for the SPIA study of POR in the CGIAR is to demonstrate accountability for the large and growing level of investments made, this would seem to imply that a focus only on intermediate products such as outcomes and influences is insufficient to meet the demands of key stakeholders. Although documenting these elements is valuable and challenging enough, additional efforts must be devoted to moving further down along the impact pathway from research to the impact on ultimate goals of the CGIAR related to poverty alleviation, food security, and environmental protection and enhancement.

To date, virtually all CGIAR POR impact assessments have been supply led, i.e., they started with the outputs from a center's research and examined to what extent these had had an effect (influence) on a given policy. A demand-led approach would start with a policy change and work backwards from this to investigate the (multiple) forces and pathways by which this change has occurred – to observe whether the center's work played any role and if so what difference it made. This implies potentially long time frames with multiple actors and impact pathways and is arguably more fraught than supply-led approaches.

This study concludes with several options that could be considered (solely or in some combination) in undertaking a recommended second phase to this study:

- Undertake a thorough review of methodologies in POR impact assessment that could be used effectively in the future to enhance accountability, especially how to assess the impact of generic policy 'knowledge' that is available to all as an international public good, in contrast to specific policy influence on individual countries (i.e., national public goods) or agencies

- Select from the existing set of 24 POR impact assessment studies several that document 'influence' and seek to extend those analyses to the next stage along the impact pathway
- Undertake new studies using a multi-disciplinary demand-side perspective that seek to document the influence/impact of CGIAR POR work in those areas and how it compares to the influence of the POR of other institutions and the contributions of other actors in the policy/political milieu
- Identify completed crop germplasm improvement/integrated pest management supply-side impact assessments for which success depended critically on a specific science policy or facilitation of a regulation (e.g., biological control of the cassava mealybug) and attempt to attribute part of the already estimated overall benefits achieved to the supportive POR that was required
- Undertake new supply-side POR impact assessments where it is perceived that there may have been significant influences and impacts from POR that are as yet undocumented and unmeasured.

1. Introduction

While the documented impact of Consultative Group on International Agricultural Research (CGIAR) work in the areas of crop germplasm improvement and integrated pest management is ample and compelling (Evenson and Gollin, 2003; Raitzer, 2003), the impact of work in other areas, including natural resources management research and policy-oriented research (POR), remains under-evaluated (Lele et al., 2003). The present study deals with the latter category of research. POR comprises a growing share of the CGIAR research portfolio, yet may be the area of CGIAR activities with the least available evidence of impact. POR (hereafter also referred to as 'policy research') is a broad and comprehensive term which encompasses everything from basic descriptive research, to applied activities resulting in suggested specific courses of action directly disseminated to legislative and regulatory bodies or development agencies, with the intention of influencing policy. The reference to 'policy' in this study does not define the sector or discipline of research; rather, this classification is based on the intended primary pathway to impact. Hence the research involved can be in the social, biological, or physical sciences, as long as it was undertaken primarily to influence policy as a means of generating ultimate impact.

It is presently not possible to pinpoint the reasons for the limited impact assessment activity related to policy research. Difficulties in measuring such impacts quantitatively and problems of attribution are, however, important constraints to the documentation of impact thus far. Pardey and Smith (2004) address these and other issues in one of the few publications on this subject.[1] With policy outcomes, there is often no objective indicator of innovation source, and there are usually many simultaneous and complementary sources of information, influence, and advocacy behind policy formulation. Further, one can postulate that the greater the impact of CGIAR research on positive and successful policy changes, the more the policy-makers will probably want to claim the responsibility for the ideas and innovations that led to the changes. If this is the case, then a major attribution problem may arise, since the evidence for attribution, or claims of causality from research to policy change, has to rely to a great extent on the statements of policy-makers for verification. Annex A reviews some of the recent literature on how research is used in policy-making processes, and the challenge that this implies for those who are charged with the responsibility of assessing and attributing the influences and impacts of POR.

Further complicating attribution is the fact that relevant policy innovations from research with global public goods characteristics are rarely directly adoptable by target policy-makers. Rather, these innovations diffuse through adaptation and refinement by advocates and analysts into the policy recommendations for specific local situations, which then help to inform the decisions of policy-makers. Adoption or influence at each of these stages in such a context is far from a linear, binary decision, as use may range from symbolic or selective to strategic. Indeed, given the number of intermediate adoption and adaptation steps, in many cases, attribution beyond influence is particularly difficult. This is particularly so when 'impact' is defined as ultimate benefits to the poor or the environment that result from improved policies or from the maintenance of existing beneficial policies, as a result of research influence. To get to this further step of 'impact' involves attribution along a very long chain of sequential adoption/implementation steps.

Counterfactual issues are complicated in assessment of the influence or impacts of policy research, as it is difficult if not impossible to conduct socioeconomic experiments in the policy sciences. Additionally, research often simply reinforces the wisdom of current policy settings. In such cases, there is no evident change in policies, yet impacts have occurred by maintaining beneficial policies ('losses avoided'). Attributing the research outcome

(influence on not changing the policy in this case) to confirmatory research is especially difficult to discern, document, and assess. Indeed, in such cases, it may be useful to refer to the contribution of information from research to policy-making processes rather than attempting to 'attribute' the effect or influence on particular policies. Some evaluators (e.g., Earl et al., 2001; Krugman, 2004) have argued that assessing the added value of such contributions to processes is all that may be feasible. The risk here is that accepting this may create moral hazards where, if influence on policy is regarded as sufficient, institutions will not have incentives to be selective about the influences they create.

However, such methodological difficulties do not reduce the need for impact to be demonstrated as the result of POR. Indeed, this study originated at the request of several members of the CGIAR, starting with a formal request at the CGIAR Annual General Meeting in 2003. The CGIAR and its stakeholders want evidence of impact from their growing level of investment in this arena. Influence may be necessary but not sufficient in this respect; the relevance and utility of the influence must be demonstrated. This is particularly the case if the potential positive complementarities between policy and biologically oriented research are taken into consideration (e.g., a sectoral policy shift may increase significantly the impact of CGIAR biological technology, and a major macro-policy shift may impair the viability of some agricultural subsectors). A recent review of the impacts of the Australian Centre for International Agricultural Research (ACIAR)'s research on agricultural policy recommended that this linkage be made more explicit in project development in future (Pearce, 2005).

As a result, progress towards a credible set of impact assessment methods for POR is very much needed, together with the results of applying those methods to a number of key policy research case studies. Relevant approaches may depend significantly on more qualitative methods for attribution and the establishment of counterfactuals. It may also only be possible to assess outcomes, influences, and likely impact pathways, stopping short of translating these into actual impacts on the poor, the food insecure, and the environment for some research areas. However, it should be noted that this uncertainty lowers the expected value of impacts.

Objectives

This Standing Panel on Impact Assessment (SPIA) scoping study is a first response to the expressed increasing need for more explicit and tangible evidence of the influence and impact of increasing CGIAR investments in POR. The specific objectives of the study were as follows:

1. Review the conceptual literature on the role of scientific information in the process of policy-making, with particular emphasis on agriculture and natural resources. This analysis discusses reasonable bounds for expectations of measurable impact as well as defining the context for attribution of specific sources of information among other influences on policy outcomes.
2. Devise a clear and useful taxonomy to distinguish between the different forms of CGIAR POR and their logical impact pathways, and compile data on project profiles and associated investment trends in these various types of policy-oriented social and other science research in the system.
3. Compile a catalog of *ex post* impact assessment (epIA) studies of POR (social and other sciences) conducted in the international agricultural research centers (IARCs) of the CGIAR; review the methods employed and compare them with best practices; and document the results obtained, and the extent to which impact pathways were identified in the project documents.
4. Assemble and synthesize documented evidence of outcomes, influences, policy responses, and resulting impacts on the poor, the food insecure, and the environment, from policy-oriented CGIAR research. Compare and contrast these with the CGIAR's investments in various categories of POR described in Objective 2.

5. With a small panel of recognized experts, discuss and agree on:
   - The taxonomy of POR categories identified under Objective 2
   - The methods, lessons, and principles identified in Objective 3
   - The methodological constraints to the attribution of mission-level impacts from the influence of research on policies
   - Impact pathways for POR.
6. To make recommendations about the need for future impact assessment activities in this area, including the value and desirability of conducting case studies of POR to further articulate, document, and measure impacts.

The overall purpose of the scoping study is to assess what has been done in the past in the way of POR impact assessment and what needs to be done in the future, i.e., whether further, more detailed assessment of impacts via POR is necessary and feasible and, if so, to identify specific potential options that could form the basis for this.

In the next section an overview of some indicators of the various products that emerge from POR is presented followed by a discussion of the approaches and major challenges involved in documenting impacts from POR. A review and assessment of the CGIAR POR impact assessment studies conducted to date follows. We conclude with some options in moving forward with a broader and deeper assessment of the influence and impact of POR in the CGIAR.

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1 In addition the International Food Policy Research Institute (IFPRI) has, since the mid-1990s, carried out a variety of activities aimed at assessing the impact of its policy research, e.g., a jointly sponsored workshop with the Dutch Ministry of Foreign Affairs to assess the impact of policy-oriented social science research in 2001 (Ryan, 2002a) and a stocktaking workshop of impact assessment of food policy research in 2004 (Anderson et al., 2005). Ryan and Garrett (2003) detail some of the lessons learned by IFPRI in the conduct of POR impact assessment for both enhancing future impacts and in designing and conducting future impact studies. The review of the Australian Centre for International Agricultural Research (ACIAR)'s research on agricultural policy by Pearce (2005) draws similar lessons.

2. Indicators of the Influence and Impact of Policy-Oriented Research[2]

Ex post studies of the benefits from POR investments may focus on three sequential steps along the impact pathway (Figure 1 and Annex A).

1. Diffusion
2. Influence or policy response
3. Impact.

Studies of **diffusion** (also termed uptake) may look at citations and other measures of the degree to which there is awareness and transmission of research findings among different audiences, such as surveys. While these metrics may demonstrate readership and that findings are relevant to audience interests, in isolation such measures offer few insights about influence on specific non-academic target groups and the extent to which one can attribute changes in policies resulting from particular pieces of research.

Studies of **influence** or **outcomes** attempt to ascertain the degree to which the perceptions, conceptions, and/or responses of policy-makers involved in relevant policy processes have been changed (or confirmed) by specific information sources. Surveys and interviews of those involved in the policy-making process are the typical techniques employed in such analyses. However, without additional analysis, studies of influence on policy do not establish what the benefits are relative to a counterfactual scenario of policy conceived in the absence of the research being assessed.

Impact assessment studies of POR typically first analyze influence, so as to identify a plausible scenario of policy evolution in the absence of the assessed research. Thus, assessment of influence is a necessary precursor to impact assessment. Benefits under a counterfactual policy scenario are compared with benefits under that actual scenario of policy evolution to identify those benefits that can be attributed to the research. To quantify the magnitude and distribution of these benefits, economic models may often be employed.

Table 1 lists some indicators of the various products that flow from POR as arrayed in Figure 1. These products are generally sequential. Evidence becomes more difficult to assemble as one moves from outputs to impacts. Generally, the responsibility of staff and management for documentation and evaluation of these products decreases on

Figure 1. Framework for impact evaluation of POR[3]

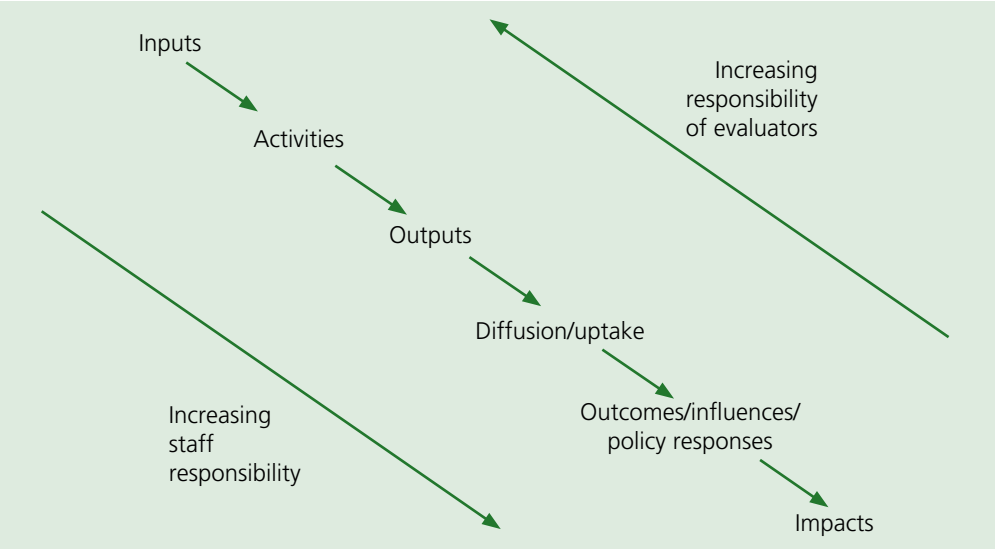


Table 1. Some indicators of the products of POR in the CGIAR context

Outputs	Diffusion/uptake	Outcomes/influences/ policy responses	Impacts
Publications • Number and type • Refereed/non-refereed Methodologies • Description • Value added Training • Number of trainees • Extent of training • Duration of training • Number and type of manuals Seminars/symposia/ conferences • Number • Type • Number of participants Press releases • Number • Type Press conferences • Number • Type Capacity-strengthening of partner institutions	Publications • Citations, use in curricula, circulation numbers, sales, requests, web hits Methodologies • Use of new methodologies Training • Trainee promotions • Number of others trained by trainees Seminars/symposia/conferences • Number of policy-makers present and influence on policy • Invitations to center staff to present keynote and other papers at other meetings – number, organizations, and whether expenses are paid Press releases • Number of press releases published and in what fora; letters to editors spawned as a result Press conferences • Number of press articles that resulted and in what fora Capacity strengthening • Invitations to center staff and management to be on committees adjudicating policy changes in partner organizations and countries • Refereeing assignments of center staff, requests for additional research in response to earlier outputs • Degree of success in acquiring additional resources for policy research to partner institutions	Changes in policies attributable to policy research Reinforcement of existing policies Implementation of policy changes Changes in institutions	Reduced poverty Improved food and nutrition security Sustained livelihoods of the poor Enhanced natural environment

the same continuum, whereas the role of independent peer evaluators increases (Figure 1).

For this framework to be operationalized in monitoring, staff must record output, diffusion, and outcome/influence/policy response indicators as a matter of course. These indicators should relate directly to expected milestones and achievements in work plans.

Investors in public research and development are no longer satisfied with activity- and output-based progress reports. They expect outcome/influence and impact evaluation; that is, objective assessments of the actual effects of the funded program on the target population (Easterling, 2000; Raitzer and Winkel, 2005).

2 This section has drawn liberally from Ryan (2004) and Ryan and Garrett (2005).
3 The graphic is not meant to imply the policy process is linear but only to portray the respective responsibilities of staff and evaluators in assessing impact.

3. Challenges and Approaches in Policy-Oriented Research Impact Assessment

Policy-making is a serendipitous process, which is often driven by individual expectations of political support, rather than clear intentions to implement socially optimal solutions to problems. Furthermore, decision-makers are flooded with information, and have limited capacity and willingness to consider external analyses (see Annex A). In this context, the primary pathways by which decisions are influenced usually involve long-term indirect changes to the general understanding of the context in which decisions are taken and to the knowledge base of decision-makers. People make decisions based on past experience and on ideas they have integrated over time. It is therefore a key objective of POR that ideas generated or confirmed through the research process find their way to the actual decision-makers so that when they make decisions (which may appear to be intuitive), they are doing so with this as part of their knowledge set.

The use of policy-oriented information is neither observable nor easy to track, as there are no reliable objectively verifiable indicators of adoption. To have impact, decision-making processes related to policy formulation must be influenced and altered relative to the course of events without the information. However, the basis for a particular decision taken by a policy-maker is rarely revealed. To determine how a particular decision was taken, those involved must be queried about the deliberative process involved and information sources considered. Thus, attribution of the role of information in a decision will depend upon subjective recall by those concerned, and is necessarily qualitative. Depending on the motives of the decision-maker and the survey techniques employed, such recollections may over- or under-attribute the actual role of the information source concerned. Furthermore, as such techniques depend upon individual recall of prior events, there may be a limit to how far into the past assessment can proceed, since policy-makers may change positions and individual memory may fade.

It should also be recognized that, when influential, policy recommendations are often partially adopted, or are adapted and modified through the long and indirect process of influence and political compromise. Moreover, the benefits of an improved policy are often difficult to quantify. In the context of developing countries, where corruption is common and institutions are frequently weak, there is often also a wide gap between stated policies and enforced rules. Even when new regulations and programs are well implemented, the generation of economic benefits and poverty impacts often depends upon the responses of farmers and other resource managers to the new sets of incentives established by the policy reform. Thus, the causal pathway from policy influence to impact may often be particularly protracted and difficult to attribute. In this challenging context, impact assessments can employ quantitative or qualitative approaches, or a mixture of both.

Quantitative approaches attempt to assess and attribute the welfare impacts of POR, but a large void has existed in the economics literature with respect to the empirical estimation of the benefits of social science research (Smith and Pardey, 1997; Pardey and Smith, 2004). However there have been a few notable exceptions, such as Norton and Schimmelpfennig's (2001) Bayesian approach to value the benefits of risk management research, Ryan's (2002b) use of benefit–cost analysis to assess research on alternative rice trade policies in Vietnam, and Ryan and Meng's (2004) use of experimental economics evaluation methods to assess the effects of research on food for education policies in Bangladesh on schooling outcomes and earnings. The dearth of empirical studies may be due to the attribution difficulties noted above, which limit the number of cases for which quantitative methods may be feasible.

Quantitative methods are particularly useful to assess historical trends in rates of return; compare returns across different geographical,

environmental, and political conditions; and to assign investment priorities. However, these methods cannot provide insights into the policy process and how policy-makers use research information. Just as assessments of investment in agricultural research and development do not describe how technologies enhance production or which of the seed's genes need to be tweaked, quantitative approaches do not illuminate how economic research influences policy choices or which policy actors should be targeted with research information. Policy-making remains largely a black box, giving little idea of how the research had an impact, if any, or how its value could be improved or recommendations could have been communicated more effectively.

Qualitative evaluations describe the processes by which research outputs influence policy formulation. They often take the form of retrospective narratives (Adams, 1983; Islam and Garrett, 1997; Campbell and Squires, 1998; Ryan 1999b; Babu, 2000; Richardson, 2001).[4] They involve interviews with professional peers, advocates, policy-makers, and their advisers and analysts. These elicit their familiarity with the research, how it compares with alternative sources of information, and what influences it had on the timing and design of policy. Generally, qualitative methods focus on influence, rather than impact.

Evaluators can also blend quantitative and qualitative approaches. In fact, there are few quantitative methods that establish causality without qualitative investigation of the policy-making process. Ryan (1999a, 2002b) describes how research interacted with the institutional and political environment to lead Vietnam to relax rice export quotas and liberalize internal restrictions on rice trading. A quantitative model is used to estimate the value of the resultant policy changes to rice farmers, the government, and rice consumers over time.

Regardless of the approach used in POR impact assessment, analysts confront a number of empirical issues in the design and conduct of studies:

- Their scale and scope
- The timing, taking account of research–policy lags and policy horizons
- Supply- versus demand-side approaches
- Importance of surprise – confirmatory versus anticipatory research
- Attribution and counterfactuals
- Choice of indicators
- Sampling
- *Ex ante* and *ex post* assessments.

A more detailed consideration of these issues in contained in Annex B.

4 Arguably one of the most impressive retrospective narratives is that of Campbell and Squires (1998). They describe the evolution of policies on the management of dolphin kills and tuna fishing in the seas around Australia and the role that biological and economic policy research played in policy development. Biological research on the synergy between dolphins and tuna and population dynamics began 20 years prior to the emergence of the problems of overexploitation of the tuna fisheries and the related problem of dolphin kills. This research was critical to later bio-economic modeling, which was used to establish policies regulating tuna catches. Economic research provided information on the economic consequences of various policy choices. Biological and economic research was complementary in influencing policy in this instance. This is a good example of anticipatory research producing public goods, which could only have been done with public funding.

4. Scope and Extent of Policy-Oriented Research in the CGIAR

The CGIAR's policy-oriented research portfolio

Policy-oriented research in the CGIAR currently comprises a heterogeneous range of activities in a broad array of sectors related to policies for economic development, agricultural research and development, natural resources regulation/management, and institutional development. These range from strategic research on relationships among natural and social processes to applied activities that focus on prior understanding to derive specific recommendations for the policies of individual clients. Both normative and descriptive work is included in the CGIAR research portfolio. It is intended that much of the CGIAR's work, including POR, should result in global or international public goods, or outputs that are relevant and accessible to users/audiences across the globe. The ultimate goals of POR, like all activities of the IARCs, are poverty alleviation, enhancement of food security, and sustainability of natural resources for the poor in developing countries. Understanding how POR ultimately translates into helping to attain these goals is an important ingredient in impact assessment of POR. Indeed some (e.g., Earl et al., 2001; Krugman, 2004) argue that it is sufficient to describe what has been done in POR, with whom, with what change in mind, and how the main actors changed their activities and actions, stopping short of measuring and attributing impact. Although often not stated, such approaches also imply the inescapable need for attribution and counterfactuals, as change is involved and requires a point of reference.

History of policy-oriented research in the CGIAR

While policy outcomes or responses are now considered a clear objective of much research in the CGIAR, for most of the Group's history this has not been the case. During the initial years of the CGIAR, policy-oriented work was viewed as a complement to technology development, as socioeconomics research focused on analysis of whether specific policies enhanced or constrained the adoption of technologies developed by the centers (Anderson et al., 1987). When the International Food Policy Research Institute (IFPRI) joined the CGIAR in 1979, POR within the Group became an explicit objective. Gradually, POR began to take greater prominence in other centers as well, as concerns grew regarding management of the social and environmental effects of new agricultural practices through appropriate policies. In addition, for certain sectors and regions, inadequate institutions and inappropriate policies began to be recognized as major impediments to agricultural growth and development, which in turn also led to a greater focus on policy enhancement.

In the early 1990s POR expanded even further as the CGIAR's portfolio grew to encompass much more research on natural resources management after the addition of the International Water Management Institute (IWMI), the World Agroforestry Centre (ICRAF), and the Center for International Forestry Research (CIFOR) to the Group (de Janvry et al., 1996). As many topics within this area concern the management of collectively owned resources regulated by policy regimes, a large share of this more recent research is considered POR. As a result of these trends, the CGIAR has now become a system in which every center has a significant investment in POR, and a number of centers are dominated by research in this area.

Four of the current IARCs could be considered almost entirely policy oriented. These are the CIFOR, IFPRI, IWMI, and the International Plant Genetic Resources Institute (IPGRI). The International Service for National Agricultural Research (ISNAR; closed in 2003, with relevant programs incorporated into IFPRI) was also almost entirely policy oriented, while the WorldFish Center (formerly the International Center for Living Aquatic Resources Management, ICLARM) has a strong policy orientation. ICRAF and the

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) also have a significant amount of POR in their portfolios. Other centers have smaller policy-relevant programs.

CGIAR investment in policy-oriented research

It is currently not possible to provide precise estimates of the CGIAR's investment in POR, as the recent classification of research investments is based upon 'outputs'[5] that are not mutually exclusive. In fact, the 'policy' output is actually an intermediate result to the achievement of longer term goals related to the other outputs, such as increased sustainability and enhanced biodiversity. For this reason, much of the POR is not listed entirely within the 'policy' category, and only 16 percent of 2004 expenditures (and an estimated 18 percent in 2005) are classified as 'policy' using this more narrow definition. Using these official percentages of budgets dedicated to policy research (narrowly defined), total cumulative investment by the CGIAR in this area amounted to US$800 million in real 2004 terms, by the beginning of 2005, and annual investments in recent years are rising both on a relative and absolute basis (Figure 2).

However, if all research projects that list policy-makers, governments, or development agencies as 'users' are placed in the 'policy' category, then almost half of the 2003 CGIAR portfolio could be considered POR.[6] Users or 'clients' is not an easy category to define, as research is often utilized by intermediate agencies that adapt findings to particular policy contexts, as well as those who advocate for policy change by policy-makers. Thus, while boundary partners, or the agencies with whom an IARC is working directly, may not include policy-makers, research may still be policy oriented. Thus, if there were an improved research characterization system in the CGIAR, a more accurate picture would emerge.

Figure 3 provides an overview of the proportion of the 2003 IARC portfolios that may be considered POR. These are upper-bound figures (as the classification is based on projects that have a number of joint products rather than one, which makes budget share estimates hazardous), but it does illustrate

Figure 2. Relative and absolute investment (in real US$ 2004) in more narrowly defined CGIAR POR activities (statistics from CGIAR financial reports)

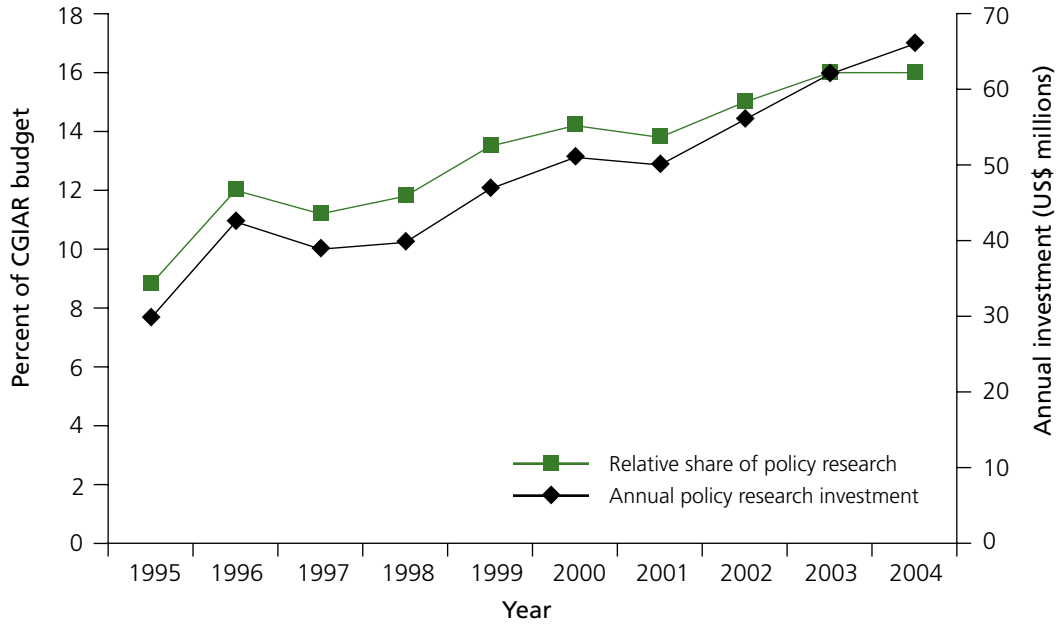
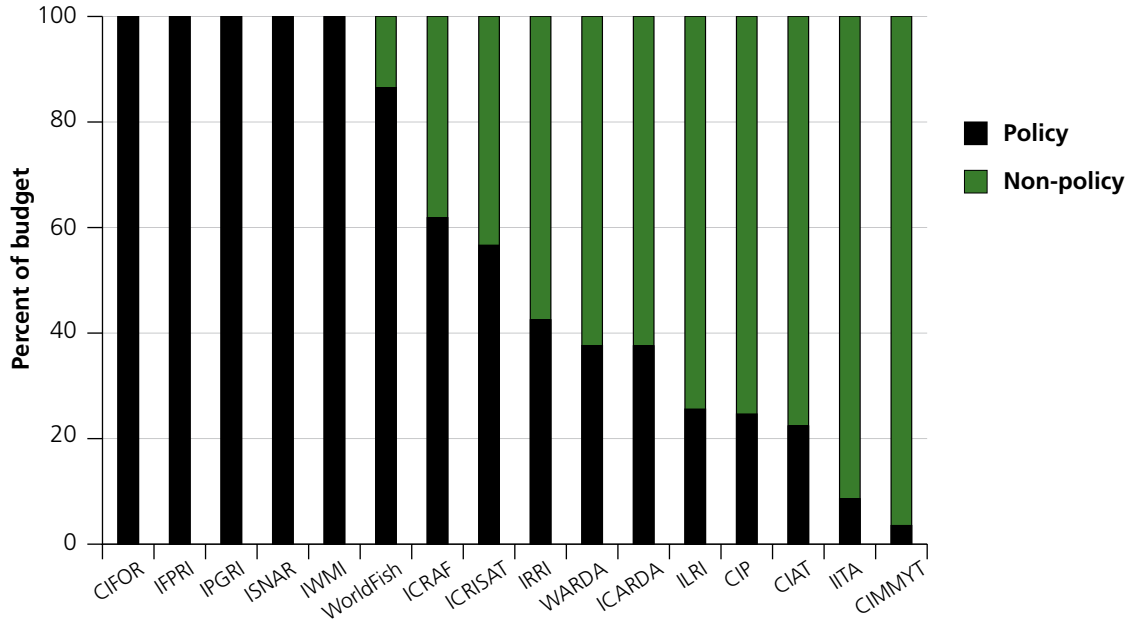


Figure 3. Upper-bound proportions of 2003 IARC budgets dedicated to POR activities, very broadly defined



that policy-oriented activities probably contribute to a larger share of the research portfolio than is commonly officially reported. If these upper bound figures are correct however, and policy-oriented proportions of the research portfolios have been similarly underestimated by two-thirds over the CGIAR's history, total cumulative investment could be in the vicinity of US$2.5 billion, rather than the US$0.8 billion above.

Categories of policy-oriented research

The CGIAR's POR projects typically fall into one of the following four research categories:

- Process-oriented
- Methods-oriented
- Policy analysis
- Management-oriented.

Unfortunately there were no data readily available on the relative investments in these four categories.

Process-oriented research is primarily descriptive, and is oriented towards identifying and analyzing theories, problems, relationships (including human behavior), and conditions, or providing insights and/or data for incorporation in future research activities. The primary direct intended audiences for process-oriented research are the research community, technical experts in government agencies, and advocacy groups. By utilizing these results, it is assumed that the recommendations and interventions of these actors will be improved, albeit often through long and indirect channels.

Using the centers' 2003–05 MTPs, project examples include research on:

- Analysis of drivers and conditions underlying 40 'bright spots' (communities that reversed degradation processes and improved livelihoods) in Asia, Latin America, Africa and Central Asia (IWMI)
- Analysis of underlying causes of deforestation (CIFOR)
- Spatial patterns and processes in the agriculture, environment, and poverty nexus (IFPRI)
- Village-level studies of socioeconomic dynamics in India (ICRISAT).

Method-oriented research is intended to assemble, synthesize, and embed existing understanding in specific tools that can inform and support the work of applied researchers, technical policy advisors/analysts, and officials of development agencies. While the tools are often based on extensive research, they are intended to be used in applied policy analysis.

Project examples include:
- International model for policy analysis of agricultural commodities and trade (IFPRI)
- Policy dialog model for water use in agriculture (IWMI)
- Collaborative learning tool to facilitate social learning processes (CIFOR).

Policy analysis research is oriented towards providing recommendations for specific policy changes by comparing the projected outcomes of a number of policy options. The intended audiences for these analyses are government decision-makers in international agencies, ministries, and parliaments and the advocacy groups that attempt to influence them.

Project examples include:
- Technical assistance to the Vietnamese Ministry of Agriculture and Rural Development regarding trade policies for rice (IFPRI)
- CIFOR's technical assistance to the government of Indonesia regarding removal of an export ban on rattan
- IPGRI's involvement in the design of the International Treaty on Plant Genetic Resources for Food and Agriculture.

Management-oriented research is intended to improve specific practices employed in the utilization of resources to produce intended products. This research may be oriented towards institutional practices, such as research management, or it may be oriented towards recommendations for natural resources management.

Project examples include:
- CIFOR's criteria and indicators for sustainable forest management
- ISNAR's work on information systems for agricultural research management;
- WorldFish's work on fisheries co-management methods.

5 Logframe outputs include: sustainable production, germplasm improvement, germplasm collection, policy, and enhanced national agricultural research systems.
6 Based on analysis of the centers' 2003–2005 MTPs.

5. Influence and Impact Assessments of CGIAR Policy-Oriented Research

Analysis of coverage

An inventory of all centers' impact assessment work to date was undertaken through searches in bibliographic databases, perusal of centers' publications lists, and queries to all of the centers. This inventory identified 24 different studies that trace the diffusion, influence, and/or impact of CGIAR POR activities (see Annex C). Fourteen of these were conducted by IFPRI, three by CIFOR, two each by IPGRI and the WorldFish Center, and one each by the International Center for Agricultural Research in the Dry Areas (ICARDA), IWMI, and ASB.

Of the 24 studies, it appears that only three successfully identify the prevalence of benefits from policy enhancement attributable to specific research. These studies are all from IFPRI, and are all policy analysis research oriented towards the evaluation of policy options for specific national contexts. The scope of each analysis is a single research theme and a single policy outcome. Implicit in the choice of a single research theme and a single policy outcome is the recognition that this type of impact assessment is more feasible to document. This in no way implies that there are not other contributions from CGIAR POR that are multi-theme and have multi-policy influences, but these are more difficult to track. The three studies that went as far as impact were:

- Impact of IFPRI's policy research on resource allocation and food security in Bangladesh
- Assessing the impact of rice policy changes in Vietnam and the contribution of policy research
- The contribution of IFPRI research and the impact of the Food for Education program in Bangladesh on schooling outcomes and earnings.

Thirteen of the studies attempt to identify the influence of POR activities on specific policies or policy-making processes, including the three studies that assess impact. Thus, 10 of these do not identify the benefits attributable to any influence. Nine of the 13 are research activities focused on results for specific national policy-makers.

The 10 studies that attempt to document influence but without identifying specific impacts are:

- Assessing the impact of policy research and capacity building by IFPRI in Malawi
- External impact assessment of IFPRI's 2020 Vision for Food, Agriculture, and the Environment initiative
- IFPRI and the abolition of the wheat flour ration shops in Pakistan: A case study on policy-making and the use and impact of research
- The impact of IFPRI's research program on rural finance policies for food security for the poor
- The influence of IDRC-supported research on water demand management in Syria: Case study of policy influence in the supplemental irrigation with brackish water project
- The sustainability of forest management: Assessing the impact of CIFOR criteria and indicators research
- Impacts of IFPRI/ICARDA policy and property rights research on the Mashreq and Maghreb project
- ISNAR's achievements, impacts, and constraints: An assessment of organizational performance and institutional impact
- An assessment of the impact of ISNAR: 1997–2001
- An analysis of IPGRI's influence on the International Treaty on Plant Genetic Resources for Food and Agriculture.

These studies of influence take different approaches to define the boundaries of the influence that they assess. Two studies focus on the collective influence of an entire research agency, while four assess the influence of research on a particular topic or theme. The remaining four focus on an observed policy or program change, and attempt to discern the influence that various research

themes of a particular agency have had on the evolution of events.

Many conclusions drawn about policy influence in these studies are qualitatively inferred. Interviews and statements about the role of research are applied in these studies to establish narratives that link the evolution of findings with policy outcomes. However, quantitative metrics of influence are rare, and in some cases the evidence behind the narrative presented is not clear. Citations analyses from bibliometric searches are sometimes included.

All 24 studies assess diffusion to some degree, while 11 studies attempt to document diffusion of research products globally. Those studies that make attempts to trace the scale of total diffusion and influence also tend not to delve further down the impact pathway. Rather, such studies attempt to trace out the number of instances of possible uptake, use, and influence. Of the 11 that assess global diffusion, four do so for all publications of a particular center, while the remaining seven assess diffusion of the outputs from a particular project or research theme. The other 13 studies assess diffusion within a limited context to establish influence.

Thirteen of the studies assess policy analysis research, 10 of which go no further than influence, while three go on to impact (Figure 4). Six studies assess method-oriented activities, three of which focus on influence. Five analyze the effects of management-oriented research, of which three assess influence. Of the four process-oriented cases, three assess only diffusion, while one case goes on to influence.

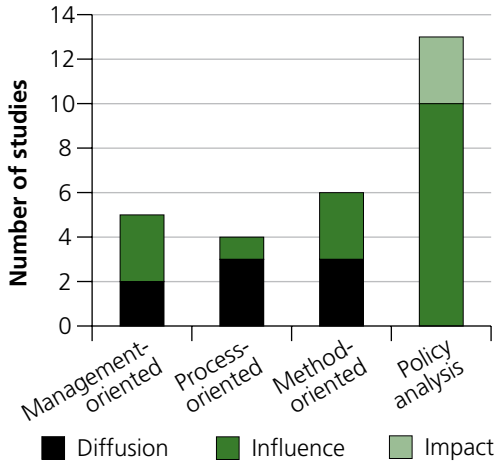
Interviews of users and researchers were the most commonly employed methods in the studies; 18 utilized this technique. Thus, even a few studies that did not go beyond diffusion conducted interviews in their attempt to document influence of the center's research on policy. All of the studies that assess influence or impact utilized interview techniques. Six studies also utilized surveys, while eight used citation analysis, and a single study used all three methods.

Of the 24 studies, 12 had authors who were independent of the assessed center. The remaining studies were authored by internal experts. External authorship does not appear to correlate with the methodologies employed in the studies, or whether individual case studies of influence or broad inventories of uptake have been pursued.

The number of assessments of diffusion, influence, and impact of POR is low at 24, compared with other areas of CGIAR-sponsored research. To date, more than 700 studies of the adoption and impact of CGIAR technologies have been produced, with approximately two-thirds of these focused on crop improvement.

In general, POR outputs of a more generic nature that have potentially wider geographic applicability, e.g., more process-oriented, have not been analyzed through to influence or impact. Several of the studies of diffusion of research with these characteristics attempt to cover a wide swath of center activities or outputs (such as all of ISNAR's work), so this may be expected. As discussed earlier, POR findings typically must be embedded in more applied policy analysis research by partners before influence can be exerted, so impact pathways are particularly protracted. This

Figure 4. Numbers of studies of diffusion, influence, and/or impact, which focus on different categories of CGIAR POR (excludes citation studies of all research by centres)



makes attribution of influence or impact challenging. It is likely that these challenges have also contributed to the low numbers of impact studies observed. Case studies of influence or impact focus principally on specific instances of technical assistance to national governments through applied policy analysis. These specific cases are much more focused, which allows interview techniques to more effectively identify patterns of causality. Similarly, these activities have more direct impact pathways, which ease the challenge of attribution.

Process-oriented POR has more features of an international public good nature, and apart from citations analysis that documents outcomes or influence, there are no definitive ways to measure impact of this *per se*. Indeed most of the studies that were able to measure impact in quantitative terms were of national rather than international public goods (e.g. Ryan, 2002b; Ryan and Meng, 2004). This illustrates one of the dilemmas facing the IARCs. They are being encouraged to strengthen their focus on the production of international public goods, while at the same time being required to be more accountable by demonstrating that their research has attributable and measurable influence and impact. Some of the challenges in giving effect to these imperatives are described in Ryan (2006).

Level of impact demonstrated

Collectively, the large-scale economic benefits demonstrated from investment in crop breeding and biocontrol alone have justified investment in all of the CGIAR IARCs many times over (Raitzer, 2003). However, the 24 POR studies produced to date do not identify enough economic benefits (about $US200 million dollars among the three studies that measured economic impact) to justify total cumulative investment in POR to date, estimated at a minimum of US$800 million.

The adequacy of the influence shown by studies to date is more difficult to appraise against investment, as clear quantitative comparison is not possible. However, for the 10 studies of influence to justify the remaining investment (at minimum, approximately US$600 million), each case of influence should be associated with benefits with an implicit value of at least US$60 million, under the most conservative assumptions about investment. This seems unlikely from the cases of influence reported, which are primarily at the level of one or two small countries. Meanwhile, if the upper bound estimate of POR investment by the CGIAR using a broad definition of US$2.5 billion is to be justified, each should generate on average US$230 million worth of influence. This seems particularly unlikely. It can be reasonably concluded that the level of measured and documented impact and influence attributed to CGIAR POR by rigorous analysis is probably insufficient at present to justify the associated total investment made to date. Considerably more impact (and influence) assessment would need to be conducted before one could be in a position to provide a definitive judgment on this.

Rigor of studies to date

The 24 studies of diffusion, influence, and impact of POR produced to date represent a heterogeneous array of methods and foci. Thus, systematic assessment of the rigor of the impact assessment methods employed therein is beyond the purview of this scoping study. However, it appears that there is room for improvement in the transparency of the presentation of findings. In particular, eight of the 13 studies that assess the influence or impact of POR do not make clear how interview or survey responses have led to the conclusions drawn, as the prevalence of different answers is not presented. Rather, a number of the studies provide only a narrative description of the policy-making process without specifically explaining what proportion of respondents or specific key informants have provided responses that suggest the explanations given. A clearer basis for findings could often be presented.

The studies of influence generally also often suffer from a lack of an explicit counterfactual scenario. Most of these studies attempt

to establish a case that the assessed research has been utilized in the determination of a new regulation or course of government action through citation or testimony. However, few of these studies, apart from IPFRI's impact assessments, attempt to identify how events would have proceeded without the assessed research. While a realistic counterfactual may be exceedingly difficult to identify in the context of many complementary and competing sources of information, the true significance of the influence of the research cannot be captured unless some sort of 'without the research' scenario is established. Thus, it remains as a future challenge for assessments of POR influence to better orient survey and interview approaches around counterfactual identification.

Only two of the studies of influence and impact identified have been published in peer-reviewed books or journals. This may also be a sign of the somewhat limited rigor observed for these studies, or it may indicate that the findings of influence have been less than persuasive about the value of the assessed research.

6. Expectations and Future Options

It appears from the foregoing review of both the literature and the studies done by the IARCs to date that there are a number of challenges remaining that need to be addressed in order to move forward in impact assessment of POR in the CGIAR. These relate to:

- Methodological advances
- Establishing counterfactuals and causalities
- Designing appropriate indicators
- Attributing and separating influences, responses, and impacts
- Difficulties of assessing impacts of truly international public goods
- Determining realistic expectations for future impact assessment of POR.

Given that the primary rationale for the SPIA study of POR in the CGIAR is to demonstrate accountability for the large and growing level of investments made, this would seem to imply that a focus only on intermediate products such as outcomes, influences, and policy responses is insufficient. Although documenting these elements is valuable and challenging enough, additional efforts must be devoted to moving further down along the impact pathway from research to the impact on ultimate goals of the CGIAR related to poverty alleviation, food security, and environmental protection and enhancement. In the process, factors that have facilitated or inhibited policy outcomes, influences, and policy responses from IARC research should also be identified, but it is doubtful if these alone will suffice for accountability purposes. The Overseas Development Institute (ODI) and IDRC studies described in Annex A focused only on these products and qualitative indicators, but there is no way of knowing whether they were viewed as sufficient justification for past and future investments in POR by the stakeholders in these organizations. Judging from the recently completed donor demands study by the SPIA (Raitzer and Winkel, 2005), investors in the CGIAR do not regard 'process-related information' as sufficient, but would like to see, in addition, evidence of returns on the investments and resulting impacts on poverty, food security, and the environment. Indicators of impact further down the pathway, i.e., those most closely related to CGIAR goals, are most preferred by investors.

To date, virtually all CGIAR POR impact assessments have been supply led, i.e., they started with the outputs from a center's research and examined to what extent these had had an effect (influence) on a given policy. A demand-led approach would start with a policy change and work backwards from this to investigate the (multiple) forces and pathways by which this change has occurred – to observe whether the center's work played any role. This implies potentially long time frames with multiple actors and impact pathways and is arguably more fraught than supply-led approaches. If accountability is the primary rationale for impact assessment, then obviously one would not be very interested in 'demand-driven' impact assessments where it is known *a priori* that centers have been peripheral in informing policy. On the other hand, analysts with learning objectives might want to study why center research did not inform significant policy changes in core areas of the CGIAR's portfolio.

Both supply- and demand-led approaches would be considered relevant if a second phase of the POR impact assessment study was undertaken that aimed to strengthen and expand upon the existing evidence of credible impacts from POR in the CGIAR. Indeed, it may be valuable for individual cases to include both types, and this may be a novel way to compare and contrast the two approaches.

Some examples (potential topics) for a demand-side approach include international and national policies related to:

- Genetic engineering/genetically modified organisms
- Degradation/erosion (conservation tillage)
- Water use efficiency (irrigation management transfer/water users' associations)

- Fertilizer, pesticide, and credit subsidies in the context of the green revolution
- Biodiversity conservation
- Sustainable forest management practices (the role of CIFOR from a supply-side perspective recently completed)
- Seed policy frameworks (including intellectual property rights in the form of plant variety protection, material transfer agreements, etc.)
- Decentralization of forest management
- Organization of and investments in agricultural research (both public and private sector) or, more generally, agricultural research policy.

Issues related to the scope of such demand-led studies, i.e., global, regional, or national, would need to be carefully considered.

Some examples of new supply-side topics might include:

- Nutritional quality improvement research priorities in plant breeding
- Trade policy – tariff cascading effects influencing the World Trade Organization (WTO)
- Farm mechanization
- Food aid
- Food and nutritional security
- Due diligence in forestry investments.

Another possible source of candidate themes is the performance measurement indicators web page, where centers now compare target outputs and outcomes from MTPs with actual achievements. These and other possibilities were discussed at a meeting in October 2006 of the SPIA and the CGIAR center impact assessment focal points. The experience of IFPRI in particular, with the use of staff focus groups for the compilation of retrospective narratives of policy influence and responses, could be informative.

7. Next Steps

The scoping study has identified the number, type, and characteristics of the CGIAR POR impact assessments to date, and provides an assessment of what has been achieved by the centers so far. Some useful studies have been identified that document impact (rice policy in Vietnam; two studies in Bangladesh) and influence (criteria and indicators for sustainable forest management; ASB; food policy research in Malawi). However, the SPIA believes this is inadequate given the strong donor interest in POR impacts and a desire for metrics that are further along the impact pathway.

Furthermore, given the investment to date in POR by the CGIAR, conservatively estimated at over US$800 million, and compared to crop germplasm improvement impact assessments, the range and number of POR impact assessments, particularly those that go beyond mere 'diffusion' and examine 'influence' and 'impact', seems inadequate. Having said this, the SPIA recognizes the higher degree of difficulty and methodological challenges inherent in attempting to document impact from POR. However, all of this clearly suggests the need for a second phase in the POR impact assessment study.

Several options (or combinations thereof) could be considered in undertaking a second phase to this study:

1. Undertake a thorough review of methodologies in POR impact assessment that could be used effectively in the future to enhance accountability, especially how to assess the impact of generic policy 'knowledge' that is available to all as an international public good, in contrast to specific policy influence to individual countries (i.e., national public goods) or agencies
2. Select from the existing set of 24 POR impact assessment studies several that document 'influence' and seek to extend those analyses to the next stage along the impact pathway, i.e., quantify economic and non-economic benefits associated with the documented policy changes where CGIAR research appears to have contributed in some way
3. Undertake new studies using a multidisciplinary demand-side perspective that seek to document the influence/impact of CGIAR POR work in those areas and how it compares to the influence of the POR of other institutions and the contributions of other actors in the policy/political milieu (see Annex A)
4. Identify completed crop germplasm improvement/integrated pest management supply-side impact assessments for which success depended critically on a specific science policy or facilitation of a regulation (e.g., biological control of the cassava mealybug) and attempt to attribute part of the already estimated overall benefits achieved to the supportive POR that was required, i.e., identifying the technologically and policy attributable impacts of the successful research
5. Undertake new supply-side POR impact assessments where it is perceived that there may have been significant influences and impacts from POR that are as yet undocumented and unmeasured;[7] at issue here would be whether it is preferable in future to randomize the selection of candidate POR themes or to 'cherry pick' those that *a priori* have been judged to have been 'successful' (see Annex A).

SPIA intends to reflect on the feasibility and desirability of each of these options. One possibility would be to select two or more cases from each of options 2 to 5. However, there may be more value to one of these approaches than the others; this will likely become clear after option 1 is completed. SPIA intends to initiate a phase II and discuss steps for the next stage of this study at the SPIA–CGIAR impact assessment focal point meeting in Nairobi in October 2006, and shortly thereafter issue a request for proposals from the IARCs and Challenge Programs for case studies which address one or more of options 2–5 above.

A strategic issue to consider is to what extent different disciplines can contribute to the second phase of this POR impact assessment study. Up until now, impact assessment of POR has been dominated by economists. To what degree could sociologists, ethnographers, political scientists, and/or historians complement economists in order to better capture the complexities of policy-making processes, and thereby improve the ability to assess influences, outcomes, responses, and impacts? Other social scientists may offer better qualitative interview, elicitation, or survey methods for quantitative analyses than economists. SPIA has decided to identify such expertise for the second phase of this study.

While POR impact assessment is a challenging enterprise, there are encouraging signs that progress may be possible. Certain center impact assessments have successfully and rigorously quantified substantial economic benefits from POR. Recent papers have suggested novel approaches, such as Bayesian analysis, which offer innovative means to appraise research benefits. Thus, with some additional investment and concerted effort, it is likely that the CGIAR will be able to offer a more conclusive answer to questions concerning the impacts of past investments in POR than has been possible so far.

7 Although much of CGIAR's POR as broadly defined has clear potential for influencing decision making, a conscious decision will be made in this study to focus only on that component of the CGIAR agenda that primarily (and not incidentally or serendipitously) targets policy changes.

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Annexes

Annex A: The policy-making process and research: Challenges for assessment and attribution[8]

Policy-making has been described as a "chaos of purposes and accidents" (Clay and Schaffer, 1984), while the deliberative processes of individual actors involved have been rarely observed to be based on rational consideration of all available information (Janis and Mann, 1979). Indeed, receptiveness to information is often based on alignment with previous ideologies, and is mitigated by other influences, such as interests and institutions (Weiss, 1977). Meanwhile, decision-makers are often flooded with many forms of competing information. In this context, instrumental direct use of research results to fundamentally shift decisions is rare. Rather, the primary pathways by which decisions are shifted are often indirect, and involve improving general understanding of the context in which decisions are taken through "conceptual influence" (Leviton and Hughes, 1981). As a result, such influence is principally indirect, and may involve a large number of intermediate adoption and diffusion events before new understanding contributes to a shift in policy. This compounds the difficulties that impact assessors face, as those documents that are utilized by decision-makers may have little apparent connection with the original research that addressed the insights embedded in new 'successful' policies. Furthermore, in the context of a multitude of influences and information sources, attribution and the identification of a counterfactual become particularly arduous.

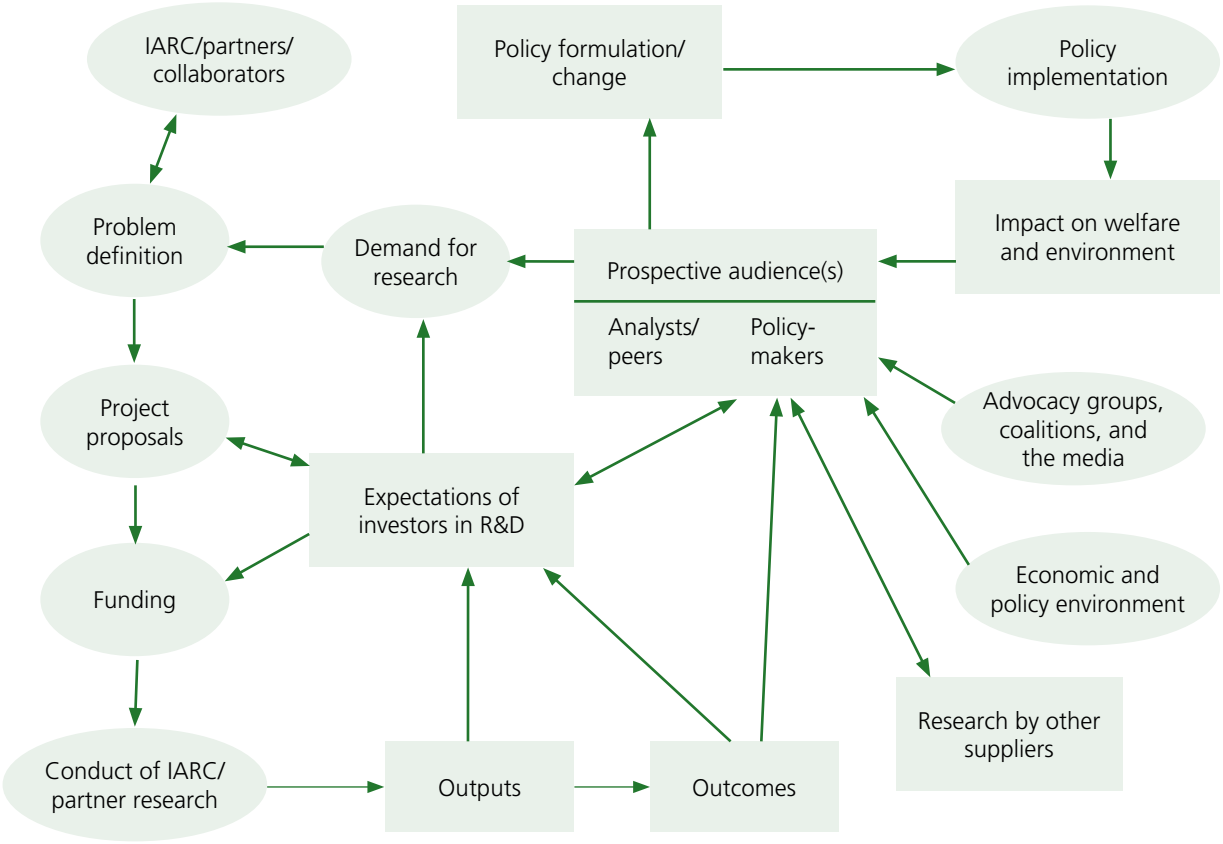
As Sutton (1999, p.32) indicates, it is important to recognize that policy-making is a political process and not, as many economists might prefer to describe it, an analytical or problem-solving one. Hence effective impact evaluation requires an understanding of the policy processes. Figure 5 is a schematic representation of the policy process and the points at which impact evaluation of economic policy research would primarily focus.

Policy formulation and change is subject to a complex array of causes and influences. These include the domestic and international economic and policy environments, including importantly the voting public, civil society, and other interest groups. Research by institutions like the IARCs and their partners is expected to also have influence, as well as that of other research suppliers. Investors in research such as national governments, aid agencies, and international institutions also have a stake in and an influence on the policy process.

Sutton's (1999) contention is that the linear model of policy-making characterized by objective analysis of options and separation of policy from implementation is inadequate. Policy-making is interactive and not linear. Separating policy-making from implementation of policy is not appropriate when trying to assess impact, as without effective implementation there is unlikely to be impact. In separating the two there is a danger that the former is viewed as the realm of politicians and the latter the task of bureaucracies. In reality continuous feedback and feedforward is a feature of the process. It is interactive and not linear, involving a diversity of actors (Scott, 2000).

Finally, it should also be noted that the pathway from policy improvement to benefits for the poor and the environment often involves a number of additional steps, which also pose additional attribution difficulties. Shifts in policy regimes may, if implemented, cause alterations in the effectiveness of programs of various agencies, and may increase market efficiency. As a result, social services may be increased, or resources may be managed in a more productive, sustainable, or equitable manner due to altered incentives. In turn, improved services may increase well-being, or improved resource management may lead to increased incomes and/or conserved resources (Figure 5). To attribute benefits from policy-oriented research activities, causality for each of these steps must also be demonstrated.

Figure 5. The policy research process and evaluation nodes. (The rectangles represent nodes where evaluation efforts would primarily focus; the ovals are the actions or influences.)



To a significant extent, the primary purpose of impact studies determines the appropriate assessment approach to use. If accountability is the major reason for evaluation, the evaluator may choose programs or projects purposively, rather than randomly. Choosing the more 'successful' candidates may more convincingly justify the investments in the institution to the public, clients, and donors. However such 'cherry picking' may not be as informative to an institution that is interested mainly in improving its quality, relevance, and effectiveness. In such instances sampling 'failures' as well as 'successes' may offer more insights.

The complexity of policy-making processes makes impact evaluation of POR a somewhat heroic enterprise, especially when one is mainly concerned with accountability of and attribution to individual institutions. In such cases one usually begins from the supply side, at the conduct of the research by the institution, and documents the outputs, outcomes, and influences on policy formulation and change via various audiences of policy-makers, policy analysts who serve them, and professional peers, taking due account of the other factors that affect these also (see Figure 5). Among the factors are the predisposing economic and policy environments and the research conducted by other suppliers, both historically and contemporaneously. The latter is especially relevant in the context of being able to attribute outcomes and policy changes to particular institutions. Thereafter the economic welfare and environmental impacts of the research-induced policy change being evaluated are assessed. Of course effective policy implementation is a necessary step in achieving impact. It is moot whether this phase of the process has ever

been or should be included as a component of impact evaluation. It is obviously a key part of enhancing impact. We will return to this later.

If attribution of impact from a specific research investment is not a primary reason for undertaking assessment, then one has better scope to explore the issue from a demand-side perspective. In this instance one would commence from a particular policy formulation/change event or related events and work backwards (see Figure 5) to the various research institutions that conducted research on the policies concerned. By focusing particularly on the audiences for the research information and eliciting from them what were the major influences on decisions, one can establish the role of the various research suppliers. This is a more satisfying and perhaps objective way to assess impact and an approach favored by the participants in a recent workshop (TAC Secretariat, 2001, p. 19). However, it may not be as effective in drawing out lessons for individual institutions in enhancing future impact as would a more supply-side approach.

Garrett and Islam (1998) suggest that social science research evaluation should look at only outputs, processes, and potential outcomes, rather than focusing on actual policy outcomes. They maintain it is difficult to establish a direct link to the policy impact of social science research and that often the research contributes to a body of knowledge that policy-makers access when and if they see fit. Garrett and Islam attribute four features to Weiss (1980) that policy-makers find useful: (1) research quality; (2) conformity to expectations; (3) action orientation; (4) challenge to the status quo.

It is contended here that evaluating the quality of the research output and the processes by which a research institute carries out and communicates its research findings is a necessary but not a sufficient condition for judging impact. Garrett and Islam maintain that it is sufficient. One must also look at post-decision impacts if an institution is going to be able to differentiate its product from others and sustain funding support in this era of increased accountability and contestability.

Some maintain that studying dissemination measures is a good proxy for POR impact. The disembodied knowledge that arises from economic policy research has the characteristics of a public good. It is non-rivalrous and once public, non-excludable (Stiglitz, 1999). Stiglitz differentiates between tacit knowledge and codified knowledge. The former involves horizontal knowledge transfers using special methods like apprenticeships, secondments, study tours, learning by doing, and institutional twinning arrangements. Codified knowledge on the other hand involves vertical transfer methods using central repositories such as libraries and electronic means that are accessed as required by interested parties.

ACIAR has also strived to document the impacts of the POR that it has funded, both *ex ante* and *ex post*. In so doing, it has conducted two *ex post* economic assessments, which attributed faster implementation of a beneficial policy change to ACIAR-funded research. Both of these studies, however, encountered difficulty in validating attribution claims through policy-maker interviews. An impressive 32 percent of ACIAR's POR has also been subjected to *ex ante* economic assessment, with an impressive average projected benefit–cost ratio of over ten to one (Pearce, 2005). This is unique among POR-related agencies.

A recent study by the IDRC of Canada (www.idrc.ca/evaluation) aimed to better understand how research can affect policy decisions. It examined in particular the IDRC research portfolio to answer three questions: What does policy influence mean? In which cases has research supported by IDRC influenced policy? What factors contribute to, or inhibit, policy influence? It did not attempt to evaluate the impact of any policy influence. The aim was to improve IDRC program management in order to enhance policy influence, rather than as an *ex post* accountability device. Through a series of 22 case studies, it commissioned consultants to develop narratives of the processes by which influence occurred. The case studies selected were not random but purposive to reflect instances where staff perceived that influence

from IDRC-supported research had occurred. The case studies were combined with deductive theory-building to generate hypotheses rather than to test them, in a collective/collaborative analysis involving staff, consultants, stakeholders, partners, and clients.

A policy influence typology was developed in the IDRC study involving four elements:

- Expanding policy capacities
- Broadening policy horizons
- Affecting policy regimes
- Developing new policy regimes.

Analyses are continuing of the determinants of success in influencing policy using this typology. Among the factors being examined are the original intent of the research project, the role played by IDRC and its inputs, project duration, the nature and extent of dissemination and communication activities, whether gender considerations were an explicit component, importance of personal and interpersonal relationships, and the context. There is to be a forthcoming publication presenting the key findings entitled *Making the Most of Research*.

The ODI has recently been involved in studies with similar objectives to that of IDRC. It has established a program titled the Research and Policy in Development Program (RAPID), and relevant papers include those by Court and Young (2003) and Start and Hoveland (2004). Four factors or domains have been identified as important in influencing policy: context, evidence, links, and external influences.

- *Context:* The studies concluded that context was the most important domain affecting the degree to which research has impact on policy. The degree of policy change is a function of political demand and contestation. The case studies supported most of the existing theory on policy processes and the percolation of ideas (Weiss, 1977). But gaps in theory include the political complexity of developing countries.
- *Evidence:* A key issue affecting uptake was whether the research provided a solution to a problem. Other issues were research relevance and credibility. Participatory processes and pilot schemes were also important, along with a communications strategy and advocacy.
- *Links:* Linkages among researchers and policy-makers are affected by trust, legitimacy, openness, and formalization of networks.
- *External influences:* These along with donor funding certainly enabled research to have an influence on policy.

The ODI study concluded that more research on these four issues and on research–policy dynamics is required in order to be able to make recommendations. More specific examples are needed where research has influenced policy in order to assess the relative importance of the four factors. ODI found it was often difficult to isolate the impact of research (if any) on policy changes and called for more case studies. It was also difficult to identify the key factors that caused policy to change. In other words, both the ODI and IDRC studies found that attribution and causality were major constraints.

A recent book edited by Stone and Maxwell (2005) contains various perspectives on the theme of bridging research and policy, including those from the ODI and IDRC studies cited above, as well as from IFPRI, the Global Development Network and others. The importance of knowledge networks is highlighted and lessons drawn for enhancing the influence of research on policy via these.

8 This section draws liberally from Ryan (2004).

Annex B: Empirical issues

Regardless of which approach is used in impact assessment, analysts still confront at least eight key issues in the design and conduct of the studies (Ryan and Garrett, 2003).

Scale and scope

Although evaluators can conduct impact evaluation at different levels of analysis (institution, program, thematic body of work, project), most case studies are at the project level. Project-level studies are easier methodologically because the generation of research information and its dissemination often occurs within limited time and space. For example, Islam and Garrett's (1997) case study looked at how specific individuals (senior advisers and bureaucrats) used the information in a specific country context (Pakistan) to arrive at a policy decision to eliminate wheat ration shops.

Arguably, however, an international organization produces knowledge as an international public good. The greatest impact of its research may actually occur *indirectly* through global effects, such as when country policy analysts employ methodologies or insights as an input into national research undertakings or when findings change common ways of looking at problems, leading to multiple changes in policy decisions across countries, institutions, and individuals (C. Farrar, personal communication, 2002).

These sorts of impacts are difficult to trace and capture. As one moves beyond the project level, more and more actors become involved, with exponentially greater sources of information and motivations. This limits the evaluator's ability to attribute policy responses to individual actors or specific pieces of research. The need for greater accountability, which seems to be a major rationale for the increased attention to impact assessment, encourages a focus on the project level, where impacts are easier to trace.

But this imperative for accountability in the short term has inherent moral hazards. It encourages an institution to focus on projects where impact is more easily attributable and to avoid longer term and arguably more risky international public good policy research. It may slant the perception of the nature of the institute (and ultimately slant the research portfolio through incentives for project work), in that projects are only a part of total research program activity and an even smaller part of institute activity. In addition, it rewards those donors who provide country-level support tied to projects, while those donors whose funding allows flexibility across topics or across countries do not receive indications of the 'impact' of their investment, creating negative incentives for donors as well (C. Farrar, personal communication, 2002).

Timing: Jumps, lags, and horizons

The policy process is not linear, or continuous. Policy-makers at different levels can make decisions on the same issue at the same time, and interact with others inside and outside the government. Gaps, jumps, and lags in this process are present from the time an issue first arises in public discussion to when policy-makers place it on the policy agenda and then make, announce, and implement policy choices (Garrett and Islam, 1998).

Because of the long lead and lag times between the completion of research and the accrual of any welfare impacts as a result of policy change, evaluations conducted soon after research is completed may not reveal any impacts, but only because it is premature to look for them. This raises another issue, termed the 'Cassandra problem' by Smith and Pardey (1997): What is the value of 'good research advice' not taken? Or of delays in taking the advice? Perhaps advice continually not taken has value in that an analyst can then articulate the 'opportunity costs' of a 'wrong' decision (that is, estimate the cost of the alternative to not taking the advice). In such instances, decision-makers presumably are not prioritizing economic efficiency, the presumed objective of the 'good research'. Alternatively, the so-called 'good advice' might indeed arise from flawed research, with the policy-makers then having 'good reasons' not to accept it.

Time lags in the production, use, and ultimate impact of research information can make the value of anticipatory research on those issues likely to be important to policy-making in the future especially high. Research findings that are readily available when policy-makers need them reduce time lags in 'production' and 'adoption'. Alternatively, research not available when policy-makers need it will, obviously, have limited impact. Anticipatory research not done can have a high opportunity cost in terms of reductions in welfare if decision-makers make a wrong policy choice as a result of not having appropriate information.

However, it can be difficult to marshal resources for anticipatory research, to work on issues that do not seem 'current'. This situation highlights the value of researchers who live and work in-country (a 'residential mode') as they will likely be more aware of the policy process, the political environment, the key issues, and critical windows of opportunity for the generation, provision, and utilization of research. It also emphasizes the value of funding public good research with long horizons.

Supply- versus demand-side approaches

Ideally impact assessment would start on the demand side from the point at which a major policy initiative occurs (the point of initial 'demand' for the information) and then work backwards from the outcome towards the research itself, assessing what institutions, researchers, and political advocates played a significant role in informing or influencing the policy change. Instead most impact case studies have started at the level of the research project and tracked how the research outputs (the 'supply side') were used. The need for attribution has dictated this approach, but it may lead to loss of information about the importance of other projects, institutions, and sources of information.

Importance of surprise

Surprise – the addition of new information to a policy-maker's understanding – is the essence of quantitative Bayesian approaches to measuring impact. However, research has also shown the value of confirmatory research that reinforces current understanding and policies (Weiss, 1980). So surprise is not necessarily a *sine qua non* of impact. Likewise, anticipatory research that alerts policy-makers to possible future scenarios and surprises can reduce the time lag between the appearance of an issue and action.

Attribution and counterfactuals

Many actors participate in the policy-making process, and they rely on various sources of information when making or influencing policy decisions (Weiss, 1977; Feldman, 1989). It is difficult then to attribute impact to any one source, as the multitude of actors, themselves with differential influence on the decision, rely on a multitude of sources. Related to this is the need to use a counterfactual scenario as the basis of comparison in order to judge what the added value of the particular research was.

Attribution becomes even more difficult when we recognize that even one information source can represent a collaborative effort. In public research, partnerships and collaboration among non-profits, universities, and governments are key and becoming the norm. A single source of information is actually a compilation of sources, making attribution to any one organization or individual exceedingly difficult. Determining contributions to decisions in such an environment may not only be difficult but politically unwise and deceptive. Investors instead should focus on the impacts produced jointly and synergistically by the partnerships.

Choice of indicators

Choice of the indicators of impact also involves some judgment. First, what is really the impact of interest? At what level and what kind of impact should the evaluator look for? Should evaluators look at *what* the research organization produces, including the format and quality of information? Or should they look at *how* the organization provides information to policy-makers and whether it

enters into the policy process and influences policy choices? Or does research have impact only when policy-makers choose and then effectively implement policies that affect final outcomes of interest, such as reductions in malnutrition or poverty?

Garrett and Islam (1998) argue for a traditional principle of monitoring and evaluation so that evaluators can hold an organization directly responsible only for those outcomes over which it has significant control. In this case, given the nature of the policy process and how policy-makers use research information, is it sensible to hold a research organization responsible for a government's particular policy choices and for the effectiveness of those choices in improving social welfare or economic growth? Garrett and Islam (1998) argue that it is not. Rather, evaluation should look more at the quality of the research outputs, the effectiveness of communicating those outputs and contributing to policy debates, and the *potential* (rather than necessarily actual) outcomes of the policy recommendations, or choices, based on research findings. Ryan (1999a, 2002b), for instance, uses an economic model to simulate potential outcomes of changes in rice trade policies in Vietnam, giving an idea of the potential value of the research. He maintains that this focus on quality of research output, processes, and potential outcomes is necessary but not sufficient for impact assessment. He argues that one must also look at post-decision impacts if an institution is going to be able to differentiate its product from others and sustain funding support.

Socioeconomic welfare is an obvious impact indicator of this nature, but it is not the only one, and it is not equivalent to the welfare of politicians. Distributional outcomes are another. Generally portrayal of distributional outcomes has proved more influential than showing the economic losses due to current policies (that is, quantifying efficiency gains from policy change). Also, articulation of local impacts is often more influential in changing policies than global estimates (Gardner, 1997; Ryan, 2002a,b).

Bibliometric indices that survey how often others cite the research offer another measure of higher level impacts on overall scientific knowledge. The improvement of data quality as a result of policy research can also be a legitimate indicator, as is evidence of increasing demand for research by policy-makers matched by additional investment in research and development. Calculating the economic value of the time saved in effecting policy changes is a valid measure of impact as well, as is qualitative information of the influences and impact of the research drawn from retrospective narratives. Historical narrative is especially valuable when the assessment starts with a demand-side approach.

Indicators are difficult to identify when the research reinforces the status quo, rather than resulting in distinct policy changes. It is equally difficult to assess situations where the research results in *inappropriate* policies or 'poisoned wells'. Bayesian approaches, for example, cannot handle such outcomes.

Sampling

A number of organizations use case studies to assess impact, posing several important methodological questions. Case studies must choose cases, but should this be random or purposive sampling? Each approach has pros and cons, and no clear consensus has emerged. Interviewing and elicitation techniques remain a concern when evaluating policy research, especially when the selection of interviewees depends to a significant extent on the researchers themselves. Of course, these concerns are valid for quantitative approaches as well.

Statistical sampling methodologies go a long way towards addressing such concerns in quantitative approaches, but qualitative researchers from disciplines such as political science, anthropology, and sociology have developed methods to deal with sampling problems as well. For example, to identify bias and triangulate results evaluators differentiate among audience types and utilize various techniques. Use of independent peers

offers objectivity and lends credibility to the impact evaluation, although limited budgets may reduce the study to a selection of only a small sample of projects and programs, leading to 'cherry picking'.

Ex ante *and* ex post *assessments*

Both *ex ante* and *ex post* assessments are important. As part of standard monitoring and evaluation, a logical framework can employ an *ex ante* assessment to gauge the likely success of policy research in achieving its objectives. Even though all projects in a portfolio may not undergo formal independent *ex post* assessment, there is still considerable value in researchers documenting outputs, outcomes/influences, and policy responses. This promotes internal learning and enhances institutional effectiveness. However, independent peer impact evaluation is still needed to ensure credibility and accountability. All assessments require databases of outputs, outcomes/influences, and policy responses to enable the evaluator to verify them, track their influence, and measure their impact.

Annex C: Studies of the diffusion, influence, and impact of CGIAR-sponsored policy-oriented research

Study	Center	Region	Sector	Type of research	Scale of policy to be influenced	Indicators assessed	Method of attribution
Spilsbury M.J. 2005. The sustainability of forest management: Assessing the impact of CIFOR criteria and indicators research.	CIFOR	Global	Forestry	Methods/ management	All	Influence	Interviews, citations
Spilsbury M.J. and Bose P. 2005. Influencing the global forest policy agenda – an evaluation of CIFOR research.	CIFOR	Global	Forestry	All	Global	Diffusion	Citations
Angelsen A. and Aryal B. Contributing to the scientific literature: citation analysis of CIFOR publications.	CIFOR	Global	Forestry	All	All	Diffusion	Citations
Gillespie B. 2004. The influence of IDRC-supported research on water demand management in Syria: Case study of policy influence in the Supplemental Irrigation with Brackish Water Project. IDRC: Ottawa, Canada.	ICARDA	Syria	Water	Process	National	Influence	Interviews
Maclean J.L., Temprosa R.M., Jhocson N.I., and Diaz A.F. 1990. Bibliographic impact of ICLARM.	ICLARM	Global	Fisheries	All	All	Diffusion	Citations
Pomeroy R.S. 2002. IDRC-supported research and its influence on public policy: A case study analysis of the Asian Fisheries Social Science Research Network. IDRC: Ottawa, Canada.	ICLARM	Asia	Fisheries	Process (networking)	All	Diffusion (capacity)	Interviews
Alwang J. and Puhazhendhi V. 2002. The impact of the International Food Policy Research Institute's research program on rural finance policies for food security for the poor. Impact Assessment Discussion Paper No. 16.	IFPRI	Global	Economics (microfinance)	Policy analysis	Global, national	Influence	Interviews
Anderson K. 2003. Impact assessment of IFPRI's research and related activities based on economy-wide modeling. Impact Assessment Discussion Paper No. 21.	IFPRI	Global	Economics (food policy/ trade)	Methods	National	Diffusion	Citations

Studies of the diffusion, influence, and impact of CGIAR-sponsored policy-oriented research (continued)

Study	Center	Region	Sector	Type of research	Scale of policy to be influenced	Indicators assessed	Method of attribution
Babu S. 2000. Impact of IFPRI's policy research on resource allocation and food security in Bangladesh. Impact Assessment Discussion Paper No. 13.	IFPRI	Bangladesh	Economics (food policy)	Policy analysis	National	Impact	Survey, interviews
Islam Y. and Garrett J.L. 1997. IFPRI and the abolition of the wheat flour ration shops in Pakistan: A case-study on policymaking and the use and impact of research. Impact Assessment Discussion Paper No. 11.	IFPRI	Pakistan	Economics (food policy)	Policy analysis	National	Influence	Interviews
Jackson C. 2005. Strengthening food policy through gender and intrahousehold analysis: Impact assessment of IFPRI multicountry research. Impact Assessment Discussion Paper No. 23.	IFPRI	Global	Economics (development strategies)	Process	All	Diffusion	Interviews
Paarlberg R. 1999. External impact assessment of IFPRI's 2020 Vision for Food, Agriculture, and the Environment initiative. Impact Assessment Discussion Paper No. 10.	IFPRI	Global	Economics (food policy)	Policy analysis	All	Influence	Interviews
Pardey P.G. and Christian J.E. 2002. The production and diffusion of policy knowledge. Impact Assessment Discussion Paper No. 14.	IFPRI	Global	Economics (food policy)	Policy analysis	All	Diffusion	Citations
Ryan J.G. 2003. Evaluating the impact of agricultural projection modeling using the IMPACT framework. Impact Assessment Discussion Paper No. 8.	IFPRI	Global	Economics (food policy)	Methods/ policy analysis	All	Diffusion	Citations, survey
Ryan J.G. 1999. Assessing the impact of policy research and capacity building by IFPRI in Malawi. Impact Assessment Discussion Paper No. 11.	IFPRI	Malawi	Economics (food policy)	Policy analysis	National	Influence	Interviews
Ryan J.G. 1999. Assessing the impact of rice policy changes in Viet Nam and the contribution of policy research. Impact Assessment Discussion Paper No. 8.	IFPRI	Vietnam	Economics (trade policy)	Policy analysis	National	Impact	Interviews

Studies of the Diffusion, Influence, and Impact of CGIAR-sponsored policy-oriented research (continued)

Study	Center	Region	Sector	Type of research	Scale of policy to be influenced	Indicators assessed	Method of attribution
Ryan J.G. and Meng X. 2004. The contribution of IFPRI research and the impact of the Food for Education Program in Bangladesh on schooling outcomes and earnings. Impact Assessment Discussion Paper No. 22.	IFPRI	Bangladesh	Economics (educational policy)	Policy analysis	National	Impact	Surveys, interviews
Sanders J.H. and Serghini H. 2003. Impacts of IFPRI/ICARDA policy and property rights research on the Mashreq and Maghreb Project. Impact Assessment Discussion Paper No. 19.	IFPRI	Middle East and North Africa	Economics (development strategies)	Policy analysis	National	Influence	Interviews
Sauve R. and Watts J. 2003. An analysis of IPGRI's influence on the International Treaty on Plant Genetic Resources for Food and Agriculture. Agricultural Systems 78: 307-327.	IPGRI	Global	Agriculture	Policy analysis	Global	Influence	Interviews, citations
Puleo A. 2002. Evaluation of the impact of IPGRI's publications.	IPGRI	Global	Agriculture	Methods/ management	All	Diffusion	Survey, interviews
Mackay R., Debela S., Smutylo T., Borges-Andrade J., and Lusthaus Ch. 1998. ISNAR's achievements, impacts, and constraints: An assessment of organizational performance and institutional impact.	ISNAR	Kenya, Morocco, Uruguay	Agriculture (research)	Methods/ policy analysis/ management	National	Influence	Interviews
Anderson J.R., Anandajayasekeram P., Craswell E., and Rukuni, M. 2004. An assessment of the impact of ISNAR: 1997–2001. Research Report 2.	ISNAR	Global	Agriculture (research)	Methods/ policy analysis/ management	National	Influence	Citations, survey, interviews
Giordano M.A., Samad M., and Namara R.E. 2007. Assessing the outcomes of IWMI's research and interventions on irrigation management transfer. In: The Impact of Natural Resource Management Research: Studies from the CGIAR (forthcoming from CABI).	IWMI	Global	Water	Management	All	Diffusion	Citations, interviews
Clark W., Contreras A., and Harmsen K. 2005. Evaluation and impact assessment of the Alternatives to Slash and Burn Program: Report of the First External Review of the Systemwide Program on Alternatives to Slash and Burn (ASB).	System level (ASB)	Global	Agriculture	Process	All	Diffusion	Surveys, interviews, citations

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